BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
CONFERENCE ROOM, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
February 2, 1972

EXAMINER HEARING

IN THE MATTER OF:	
Application of Gulf Oil Corporation for a waterflood expansion, Lea County, New Mexico.	Case No. 4652

BEFORE: Elvis A. Utz,
Alternate Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: Case 4652.

MR. HATCH: Case 4652: Application of Gulf Oil Corporation for a waterflood expansion, Lea County, New Mexico.

MR. KASTLER: If the Examiner please, I am Bill Kastler from Midland, appearing on behalf of the Gulf Oil Corporation.

Our witness today is F. W. Moran, Jr.

Our exhibits are here, and one of them should be stamped for your purposes. They are in a brochure and loose.

(Whereupon the Applicant's exhibits were marked for identification.)

MR. UTZ: I believe I asked for other appearances. Are there any?

You may proceed.

F. W. MORAN, JR.

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. KASTLER

Q State your name and occupation and employ.

A Frank W. Moran, Jr., District Reservoir Oil Superintendent, Midland District, Midland, Texas.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A Yes.

Q Are the witness' qualifications acceptable?

MR. UTZ: Yes, sir.

Q (By Mr. Kastler) Would you please outline the purpose of this hearing?

A Gulf, as operator in the Central Drinkard Unit area seeks authority to expand existing pilot water output to include an additional fifteen wells, injection wells, and to also enlarge the unit area to include three additional tracts.

Q When was the unit originally formed?

A The central in '69. It was authorized by the Commission by order of No. R-2904 dated May 6th, 1965, and was for an area consisting of 2,600 acres.

However, when the unit became effective on July 1st, 1965, three tracts, Nos. 10, 20, and 21 failed to qualify, thus contracting the area to its present size of 2,260 acres.

This is shown by Exhibit No. 1, a plat of the unit area.

These three tracts are in the shaded area.

Q When did water injection operations begin in the unit area by Commission Order R-2909 dated May 10th, 1965?

A Water injection began into the six pilot wells on September 12, 1967. The principal reason or reasons for the long delay in initiating injection was due to the protest that evolved late in 1965 when we filed our water permit

application with the State Engineer's office for the use of non-potable San Andres water in a flooding operation.

Our subsequent court hearing and later as a result of a legislative act which excluded the San Andres water, underlined the unit area from the declared underground Basin--we were permitted to use San Andres water in our pilot water flood project.

Q What type of a water flood pattern was used?

A Eighty acres, fifty spot pattern was used for the pilot area and is shown on Exhibit 1 by the green outline.

Q Why was only a pilot operation attempted here?

A At the time of unitization there were no Drinkard water floods in New Mexico and there was some doubt as to the floodability of the Formation.

For this reason it was decided to pilot the water flood project by using it on a few injection wells.

Q Briefly explain the results you have seen from the pilot water flood.

A Referring to Exhibit No. 2, which shows the performance history of the unit area before and after water injection began, it would be seen that as a result of our injecting water into six pilot wells we have succeeded in recovering a significant amount of oil over and above the amount expected without injection, thereby proving that water flooding the Drinkard Formation was not only possible, but

is feasible.

Specifically, we have reduced the unit producing gas oil ratio from a high of almost 3,000 cubic feet per barrel to a low of slightly less than 8,000 cubic feet per barrel, and have increased unit oil production from a low of 183 barrels per day in June 1968 to a high of 417 barrels per day in March, 1970. To November 1st, 1971, we have recovered almost 150,000 barrels of additional oil due to our pilot water flood project.

Q For the record, would you identify the wells which have responded to water injection?

A Six wells have shown a water flood oil response.

Q Are you referring now to Exhibit 1 again?

A Yes, sir, I am. The two Center producers, Nos. 116 and 124 and Nos. 108 and 113, 122, and 128.

MR. UTZ: 118 was one of them?

THE WITNESS: No, sir. 128 and 108.

116 is a Center producer; 124 is a Center producer; and No. 108.

Q (By Mr. Kastler) 108, that is northwest?

A Northwest. 113.

MR. UTZ: That is one I missed. Where is it?

A It is one of the yellow wells on the east side there. And 122 and 128.

Q That has been proven, the Drinkard Formation can be

successfully water flooded--what does Gulf, as unit operator, propose in regard to future operations?

A Our study of the pilot water flood performance indicates that expansion of the pilot area to include additional water injection wells will result in a recovery of additional wells and will be of a profitable venture.

We propose to convert fifteen additional wells to the water injection and to include an additional 320 acres into the unit area.

Our Exhibit No. 1 we have identified these wells as phase 1 expansion.

This, of course, does not include all of the wells within the unit boundaries.

The remaining injection wells shown by the yellow designation on Exhibit No. 1 are line wells and will be converted after we obtain the necessary cooperation from owners of offset acreage.

These wells are identified as Phase 2 expansion.

Q As distinguished from Phase 1 expansion?

A Yes.

Q Please explain the red designation shown on Exhibit No. 1.

A These are proposed cooperative water injection wells between the central Drinkard unit and Wiser Oil Company Downs lease. These are located in the southwest part of the unit area.

We are currently negotiating a lease line agreement

and a water sales contract with the Wiser Oil Company whereby we will convert the Central Drinkard unit well No. 137 and 151, and they will convert their Down No. 1 in the unit, which unit would sell them the necessary water for their injection project.

Q Is the Downs No. 1 well located here in the northeast of the southwest of Section 32?

A Yes, sir.

Q In regard to the yellow designation of the wells on this exhibit, please elaborate on your plans for converting these wells.

A As I have indicated previously, we will convert these wells when we obtain offset operations. We have been contacted with Shell Oil, who is considering the formation of a Drinkard unit along the north boundary of the central Drinkard unit, and Humble, who is studying the area along the east boundary of the unit.

We have supplied both operators with data on our flow performance, and they have appeared very receptive to forming similar units along the south boundary.

Gulf would be the major operator of the proposed Drinkard unit. We are now investigating the formation of these units. This will, of course, take time.

Q How will the new wells, injection wells shown in lieu, be equipped?

A The new ejectors will be--Exhibit No. 3 is a diagrammatic sketch of a typical Central Drinkard unit water injection well, and Exhibit No. 4 is a table showing pertinent data for each well.

Q Do you have well logs of the proposed injectors?

A Yes, these are identified as Exhibit No. A through 50.

Q Mr. Moran, would you please refer to Exhibit No. 3?

A Yes, sir.

Q And briefly outline what is shown on that exhibit?

A Exhibit No. 3 is--the outer yellow is a diagrammatic sketch of the typical water injection well.

It shows the installation of the three strings of casing, how they are cemented.

It also indicates that the tuck casing annulus will be loaded in with inhibited water.

The proposed straining of tuck will be internally coated, will be in addition to the water that will be used. It will also show the total depth of the well, the amount of open hole interval, and further point out the fact that the anticipated injection volume per well will be 1,000 barrels per day and the water source that will be used to inject into this typical well will be produced water plus make-up water from the existing pilot flood wells and the San Andres water, that which we have expected to develop elsewhere in the unit area.

Q In referring to the word typical have you used the average or the mean, or just how do you arrive at that designation?

A Well, it means in essence what it says. It is an average type typical well.

Some wells are, of course, in regard to the completion department, some of course will be,,of course, cased through the interval.

Others will be open hole, but this is a typical example. Wells will be equipped very similar to this.

MR. UTZ: They will all be tubed?

A Yes.

Q Where a typical well is not typical would the injection be through perforated intervals rather than in an open hole interval?

A Yes, sir.

Q And would the injection rate be less than 1,000 per day typical rate or would it be greater; or would you have any --are you able to make a comment on that?

A Other than the fact we anticipate that the average injection volume will be 1,000 barrels per day per day well.

Q At the average?

A Yes.

Q Rather than the typical; that is an average injection?

A Yes.

Q Mr. Moran, would you refer to Exhibit No. 4 and briefly

state what is shown thereon, without going in too much detail, but illustrate the meaning of the various columns?

A This exhibit, of course, lists all of the proposed injection wells.

In the case of the two tracts that are not in the existing area, it identifies the owner of the wells in these outside tracts. It lists the surface casing intermediate casing, the production casing, the amount of it in the hole, how it was cemented, and the position of the cement tops.

In addition, it also shows the injection intervals, either open hole or per interval, and also shows the depth of tubing and tacker setting.

Q Is this information or this data on Exhibit No. 4 useful in referring to Exhibit No. 5A through 50 for the purpose of showing on the log or ascertaining where the log cement levels are situated, the circulating depth, etc.?

A Yes, sir. You can take these logs--with Exhibit 4 you can identify the zones that we planned to inject the water.

Q And, again, you have referred to Exhibit No. 3 at the outset as being the typical or the norm of your type of completion?

A That is correct.

Q Now, Mr. Moran, earlier in your testimony you mentioned that San Andres water is being used in the pilot water

flood operation.

Do you plan to also use San Andres water in the expanded area?

A Yes. We are now using produced water and brackish San Andres water from a water supply well located in the unit area.

We plan to drill another San Andres water supply well in the unit area, and both wells, along with anticipated future produced water volumes, should supply all of the injection water wells needed for the expansion.

Q How much water will be injected into each new injection well?

A Approximately 1,000 barrels per day per well.

Q What will be the maximum well head injection pressure?

A Initially water will be injected by vacuum in the maximum well head pressure, and it should be in the range of 2,000 to 3,000 psi.

Q What will be the injection interval?

A Water will be injected into both the open hole and perforated interval of the Drinkard Formation found at an average depth of 6,500 feet.

Q Do you have any other exhibits to present?

A Yes, Exhibit No. 6 is a tabulation of the statistical production and injection data, and is the same data that is shown graphically by Exhibit No. 2.

Q In Exhibit 2 it is graphic in form and in Exhibit No. 6 tabular?

A Yes, sir.

Q Is this application, in your opinion, in the interest of prevention of waste and protection of correlative rights?

A Yes.

Q Were exhibits 1 through 6 prepared by you or at your direction and under your supervision?

A Yes.

Q What is the current status of the subsequent joinders covering tracts 10, 20, and 21?

A We already have full working interest on owner commitment of all three tracts.

Originally we received all royalty owners gratification in tract 20 and 21, but only about a 70 per cent response in tract 10.

There are at the present time additional royalties owner supports being solicited by Mobil.

The operator of Tract 10, but even if they fail to secure the required 75 per cent gratification, they may execute an indemnification agreement and still commit this tract.

As it has been for some years since the royalty owners in Tract 20 and 21--all but one of whom have interests in other tracts--consent to unitization, Atlantic Richfield

as operator of those tracts is currently in the process of obtaining recommitments.

We hopefully anticipate that sufficient response will be received on or about March 1st, 1972.

Q Have you consulted with the office of Oil & Gas in the State Lane Office?

A Yes.

Q Have you explained that in substance this enlargement of the unit area will amount to a slightly smaller percentage of a slightly larger volume of oil so that overall the participants will realize a net gain?

A Yes.

Q After this was explained, do you understand that Gulf has tentatively approval of the proposed enlargement as required by the unit agreement?

A Yes. When the instruments which provide effective equipment of these tracts are supplied we expect to obtain the formal approval of the Commissioner of Public Lands.

Q This completes our questions on direct testimony, and at this time I would like to move that Exhibits 1 through 6 be admitted into evidence.

MR. UTZ: Without objection, Exhibits 1 through 6 will be tendered in the record of this case.

Any questions of the witness?

CROSS-EXAMINATION

BY MR. UTZ

Q Mr. Moran, I am not sure that you mentioned in your testimony--it is rather hard to listen and look at the same time--the status of the producing wells in this area.

Are they predominantly marginal?

A Yes, sir, with the exception of the, of course, of the wells that are responding to injection, practically all of the wells have producing rates of oil in less than ten barrels a day. Some of them are five or less.

Q This jump in production, oh, about October, November of '69, is that a result of this project?

A Yes, it certainly is.

Q You have stated how much additional water flood oil you have already produced--how much do you anticipate that you will produce out of the unit?

A We expect from the unit area that we are trying to expand additional recovery of 7,600,000 barrels of oil.

Q I presume that you feel that this will prevent waste if you get this 7,000,000 barrels of oil?

A Yes, sir.

Q On your diagrammatic sketch, I believe it was Exhibit 3, how do you propose to detect leaks at the surface?

A Well, I can't tell exactly how. Of course, our area people will undertake that particular test procedure, but I am sure that the procedure we are now using in the pilot wells use

in the expanded portion--I can't tell you exactly what that will be.

Q But you will have means, whether it is a gauge or a valve which is left open, to determine when a well is leaking?

A Yes.

Q In the lease?

A Yes.

MR. UTZ: The witness may be excused.

(Recess.)

MR. UTZ: The hearing will come to order, please.

MR. LOPEZ: Mr. Examiner, my name is Owen Lopez, associated with the law firm of Montgomery, Federici, Andrews, Hannahs & Morris, Santa Fe. I have one witness.

MR. UTZ: I don't believe we have called the case yet, have we?

We didn't call it before.

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, RICHARD STURGES, a Certified Shorthand Reporter, in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Richard Sturges
Certified Shorthand Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 4652 heard by me on July 12, 1972.

Examiner
New Mexico Oil Conservation Commission

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